

IN THE CLAIMS

A presentation of all of the pending claims with their current status indicated follows.

Claims 1-18 (Cancelled).

19. (Original) A system for measuring the spatial dimensions of a three-dimensional object, comprising:

a lens having a high degree of chromatic aberration and a sensor defining an optical axis normal to an object plane of said object and passing through a focal point of said lens;

said sensor having at least a first photodetector and a second photodetector optically aligned with said object through said lens and by a diffraction grating disposed between said lens and said sensor, whereby said diffraction grating separates the spectrum of light reaching said sensor such that different wavelengths of light collected from said object by said lens are then directed to different photodetectors on said sensor and furthermore because of the high degree of longitudinal chromatic aberration of the lens, different wavelengths of light come to best focus in the object plane at different distances from said lens;

electrical outputs from each of said photodetectors being provided to a processor that determines a distance of said object from said lens and thereby a height of said object.

[19] 20. (Currently Amended) The system of claim [18] 19 wherein said lens has numerical aperture of at least about 0.1 to achieve a shallow depth of focus.

[20] 21. (Currently Amended) The system of claim [18] 19 wherein said lens is telecentric.

[21] 22. (Currently Amended) The system of claim 19 wherein said object is capable of motion relative to said sensor.

[22] 23. (Currently Amended) The system of claim [21] 22 wherein said motion is orthogonal to said optical axis.

[23] 24. (Currently Amended) The system of claim [21] 22 wherein said motion periodically triggers data acquisition of the sensor to build up a three dimensional representation of the object.

[24] 25. (Currently Amended) The system of claim [18] 19 wherein a multitude of photodetectors are used.

[25] 26. (Currently Amended) The system of claim [24] 25 wherein said multitude of photodetectors forms a regular rectangular array.

[26] 27. (Currently Amended) The system of claim [24] 25 wherein said processor acts as a buffer to an electronic computer, said electronic computer managing one or more of motion control, sensor image acquisition, triggering and image analysis.

[27] 28. (Currently Amended) The system of claim [26] 27 wherein said electronic processing buffer converts said electronic signal from said sensor to a gray-scale value that is subsequently converted to a height measurement.

[28] 29. (Currently Amended) The system of claim [26] 27 wherein said buffer includes an algorithm to determine z-axis height position of points on the object with respect to said nominal object plane by means of contrast comparison of said photodetectors.

Claim 29 as originally filed (Cancelled).

[30] 31. (Currently Amended) [A] The computer system as described in claim [26] 27 that compares the three-dimensional representation of said object for conformance of said object to a stored quality standard.